

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) ~~A comminution machine for all kinds of material, for example waste, such as domestic waste, bulky waste or wood, in particular organic waste or bulky waste, such as refrigerators, tires, furniture, carpets, mattresses, tree stumps, demolition timber or similar materials, which comprises a receiving element for the material (5), provided in a housing (1), at least one shaft (2), mounted in the housing (1) and capable of being driven in both directions, on which comminution tools (3) are arranged, rigid cutting tools (4) which are fitted in the housing, whose cutting edges (4.1) in the extension just to do not intersect the axis of the shaft (2) or a region around the axis, against which rigid cutting tools (4) the comminution tools of the shaft (2) comminute the material (5) put in,~~

~~in interplay between the comminution tools (3) of the shaft (2) with the rigid cutting tools (4), the material (5) being taken in a differentiated manner, being conveyed and, fixed against the rigid cutting tools (4), being comminuted with specifically low forces, characterized in that~~

~~—— a) —— the comminution tools (3), seen respectively in a direction of rotation of the shaft (2) and in their cross section, have at least two cutting regions (3.1, 3.2), of which at least an inner cutting region (3.1) is able to take and comminute more material (5) to be comminuted and has a relatively short lever arm for this purpose, and also at least one outer cutting region (3.2) is able to take and comminute less material (5) to be comminuted and has a relatively long lever arm for this purpose, the contours (3.3) of both cutting regions (3.1, 3.2) forming a circular arc about the axis of the shaft (2) in the direction of the axis of the shaft (2),~~

~~—— b) —— the rigid cutting tools (4) have a number of teeth (4.2) arranged in a manner of a saw and thus two flanks (4.3) of the teeth (4.2) at an angle to each other interact with one of the cutting regions (3.1, 3.2) in a cutting manner,~~
~~—— c) —— in each starting effective cutting position, a tip of the comminution tools (3), forming a first transverse cutter (3.4), is oriented toward a tip of a tooth (4.2) of the rigid cutting tools (4), forming a second transverse cutter (4.4), so as to be offset in parallel and cutting past, as a result of which the, besides the cutting forces produced between the cutting regions (3.1, 3.2) of the comminution tools (3) and the cutting edges (4.1) of the rigid cutting tools (4), an additional breaking edge, also arranged parallel to the axis of the shaft (2), with a parallel offset notching action on the material (5) and acting specifically highly is obtained, and~~
~~—— d) —— the material (5) is subjected to an active and additional comminution process with the aggressive participation of the teeth (4.2) of the rigid cutting tools (4)~~

A grinding machine, comprising:

a housing having a receiving element which receives material;
at least one shaft which is axially mounted in the housing;
a plurality of grinding tools connected to the at least one shaft in an angular position in an axial direction of the least one shaft, each grinding tool having a first transverse cutter, an inner cutting region and an outer cutting region such that the inner cutting region is configured to receive from the receiving element a first amount of material and the outer cutting region is configured to receive from the receiving element a second amount of material, the inner cutting region having a shorter lever arm than the outer cutting region;
and
a plurality of rigid cutting tools arranged within the housing in a fixed position on opposing sides of the least one shaft, each rigid cutting tool having teeth and a second transverse cutter wherein the at least one shaft rotates the

plurality of grinding tools such that the inner cutting region grinds the amount of material against the teeth of the rigid cutting tools, the outer cutting region grinds the other amount of material against the teeth of the rigid cutting tools and the first transverse cutter orientates in an offset parallel position toward the second transverse cutter to grind material between the first transverse cutter and the second transverse cutter.

2. (Currently Amended) The ~~comminution~~ grinding machine as ~~claimed in~~ of claim 1, ~~characterized in that wherein~~ the ~~comminution tools~~ (3) plurality of grinding tools are offset in relation to one another in their the angular position in the an axial direction ~~on~~ of the at least one shaft (2).

3. (Currently Amended) The ~~comminution~~ grinding machine as ~~claimed in~~ of claim 4 or 2, ~~characterized in that wherein~~ the ~~comminution tools~~ (3) plurality of grinding tools are arranged with in a different radial spacing from with respect to the axis of the at least one shaft (2).

4. (Currently Amended) The ~~comminution~~ grinding machine as ~~claimed in one of claims 1 to 3~~ of claim 3, ~~characterized in that wherein~~ the teeth (4.2) of the rigid cutting tools (4) ~~in their cutting contour~~ (4.5) extend offset parallel in the axial direction as a slab and, ~~in each starting cutting position, in each case one of the transverse cutters~~ (3.4) is such that the first transverse cutter is oriented toward one of the second transverse cutters (4.4) ~~in each case, cutting to grind the material with in an~~ parallel offset parallel action.

5. (Currently Amended) The ~~comminution~~ grinding machine as ~~claimed in one of claims 1 to 4~~ of claim 1, ~~characterized in that the shaft~~ (2) wherein the at least one shaft has disks (2.1) on which the ~~comminution~~ grinding tools (3) are arranged; ~~or formed, which wherein the grinding tools~~ intermesh between the

rigid cutting tools (4) ~~extending at intervals on the slab and act against these~~ the rigid cutting tools in a cutting manner.

6. (Currently Amended) The ~~comminution grinding~~ machine as ~~claimed in one of claims 1 to 5 of claim 1~~, characterized in that wherein the at least one shaft (2) has journals (2.2) which are detachably joined to the at least one shaft (2).

7. (Currently Amended) The ~~comminution grinding~~ machine as ~~claimed in one of claims 1 to 6 of claim 6~~, characterized in that wherein the journals (2.2) form a bearing region.

8. (Currently Amended) The ~~comminution grinding~~ machine as ~~claimed in one of claims 1 to 7 of claim 7~~, characterized in that the further comprising flanges which form a joint between the journals (2.2) and the at least one shaft (2) is made by means of flanges (2.3).

9. (Currently Amended) The ~~comminution grinding~~ machine as ~~claimed in one of claims 1 to 8 of claim 8~~, wherein characterized in that the housing (1) is formed with a double wall (1.1) at the ends of the housing and, in the interspace therein, a disk seal (2.4) connected to the at least one shaft (2) is provided and a type of labyrinth seal is formed as a result to form a seal.

10. (Currently Amended) The ~~comminution grinding~~ machine as ~~claimed in one of claims 1 to 9 of claim 9~~, characterized in that wherein the disk seal (2.4) is formed by the flanges (2.3).

11. (Currently Amended) The ~~comminution grinding~~ machine as ~~claimed in one of claims 1 to 10 of claim 1~~, characterized in that cutting contours (4.5) of wherein the rigid cutting tools (4) are reinforced by wearing elements (4.6).

12. (Currently Amended) The ~~comminution grinding~~ machine as ~~claimed in one of claims 1 to 11 of claim 1~~, characterized in that further comprising a means for optimizing controlling the comminution grinding machine are also provided, with which the wherein a gradient of a parameter of the ~~comminution process or of the comminution grinding process or grinding~~ machine is registered and used as a reference variable for control of the ~~comminution grinding~~ machine.

13. (New) The grinding machine according to claim 1, wherein the plurality of rigid cutting tools are fixed within the housing in a position separate from the axis of the at least one shaft.

14. (New) The grinding machine of claim 1, wherein the inner cutting region and the outer cutting region include contours which form a circular arc about the axis of the at least one shaft in the direction of the axis of the least one shaft.

15. (New) The grinding machine of claim 1, wherein the second amount of material received by the outer cutting region is less than the first amount of material received by the inner cutting region.

16. (New) The grinding machine of claim 1, wherein the plurality of grinding tools are circumferentially connected to the at least one shaft.